HP StorageWorks

Secure Path 2.0D Service Pack 3 for IBM AIX release notes

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Secure Path 2.0D Service Pack 3 for IBM AIX release notes

About this document

This section describes the content reflected in this document, including:

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Release notes information

These release notes cover the following major topics:

- New features, page 3
- Operating system specifications, page 3
- Secure Path operational features, page 4
- Operating considerations, page 6
- Avoiding problem situations, page 11

Intended audience

This document is intended for individuals responsible for installing, configuring, and maintaining HP StorageWorks Secure Path 2.0D Service Pack 3 in their IBM AIX server environment with any one of the following arrays:

- HP StorageWorks HSV100 Enterprise Virtual Array (HSV100)
- HP StorageWorks HSV110 Enterprise Virtual Array (HSV110)
- HP StorageWorks HSG80 RAID Storage System (HSG80)

Accessing future product updates

HP strongly recommends that customers sign up online using the Subscriber's choice web site: http://www.hp.com/go/e-updates.

- Subscribing to this service provides you with e-mail updates on the latest product enhancements, newest versions of drivers, and firmware documentation updates, as well as instant access to numerous other product resources.
- After signing up, you can quickly locate your products by selecting Business support and then Storage under Product Category.

Other Secure Path documentation

Additional documentation, including white papers and best-practices documents, is available at the HP web site:

http://h18006.www1.hp.com/products/sanworks/secure-path/index.html

New features

This release includes support for the following new features:

- IBM AIX 5.3 operating system
- P5–based systems

Operating system specifications

Table 1 lists the hardware and software supported by this release.

Table 1 Supported components

Host feature	Requirement
Platform	IBM RS/6000 (PCI bus only)
Operating systems	AIX 5.1, AIX 5.2, or AIX 5.3
Secure Path software kit	HP StorageWorks Secure Path 2.0D Service Pack 3 for IBM AIX
Storage systems	HSG80 RAID storage systems with dual controllers running ACS HSV100 RAID storage systems with dual controllers running VCS 3.014 or later HSV110 RAID storage systems with dual controllers running VCS 3.014 or later
Solution software kit	HP StorageWorks Solution Software 8.7 for IBM AIX HP StorageWorks IBM AIX Kit for Enterprise Virtual Array for your EVA version
Host bus adapters	PCI Adapter, 197819-B21 (DS-SWIA1-PD), PCI Adapter, 197819-B22 (DS-SWIA2-PD), or Cambex FibreQuik PC2000
FC interconnect hardware	See the *HP StorageWorks SAN design reference guide* for the latest supported adapters and switches.

Coexistence with other multipathing products

Secure Path 2.0D Service Pack 3 for IBM AIX functions in a storage area network (SAN) environment with other HP multipathing products, such as Secure Path for SUN Solaris, Secure Path for Windows®, Secure Path for HP-UX, and Secure Path for XP and VA, as defined and described in the *HP StorageWorks SAN design reference guide*, which can be downloaded from this HP web site:

http://h18006.www1.hp.com/products/storageworks/san/documentation.html

Secure Path operational features

Hardware prerequisites for Secure Path

Two paths must exist between each server and storage system. Each path must include a separate:

- Fibre Channel (FC) switch
- HSG80, HSV100, or HSV110 controller
- FC host bus adapter (FC HBA)

NOTE:

- On systems that support multiple I/O boards, HP recommends that you install each HBA on a separate I/O board. Doing so eliminates the I/O board as a single point of failure.
- Configure your RAID storage systems for FC fabric connectivity in Multiple-bus failover mode.

LUN support

Secure Path 2.0D Service Pack 3 for IBM AIX supports a maximum of four RAID systems per adapter pair, and eight adapter pairs per server. Each array supports 32 LUNs per adapter pair, one of which is the command console LUN (CCL). A total of 1024 LUNs (992 LUNs plus 32 CCLs)is supported.

Upgrading the Secure Path driver

You can download the Secure Path 2.0D Service Pack 3 for IBM AIX driver from the following HP web site:

http://h18006.www1.hp.com/products/sanworks/softwaredrivers/securepath/index.html

NOTE:

A previous version of Secure Path for IBM AIX must be installed on your system.

After downloading the software, drivers, and associated documentation to a directory of your choice, install the new driver as follows:

1. Change to the directory where you downloaded the software:

   `cd /directory_location`

2. Enter the `./SPinstall` command.
3. Depending on the type of array, enter one following commands to verify that the recover limit is modified:

   The correct results are displayed after each of the command lines.

```
# odmget -q "attribute=recovery_limit and uniquetype=disk/scsi/HSV110" PdAt
 PdAt:
        uniquetype = "disk/scsi/HSV110
        attribute = "recovery_limit"
        deflt = "15"
        values = "15"
        width = ""
        type = "R"
        generic = ""
        rep = "n"

# odmget -q "attribute=recovery_limit and uniquetype=disk/scsi/HSG80" PdAt
PdAt:
        uniquetype = "disk/scsi/HSG80"
        attribute = "recovery_limit"
        deflt = "15"
        values = "15"
        width = ""
        type = "R"
        generic = ""
        rep = "n"
        nls_index = 0
```

NOTE:

Adobe® software and High Availability Cluster Multiprocessing (HACMP) software modifications must be installed from the server.

Verifying the driver version

Enter the following command to verify that the driver version for the FC HBA is 1.6.3.7:

```
# lslpp -l PC1000.driver.obj
```

A verification message appears:

```
Fileset      Level State Description
----------------------------------------------------
Path:/usr/lib/objrepos
PC1000.driver.obj      1.6.3.7  COMMITTED Secure Path AIX Fabric
```

The EVA environment

The EVA storage system requires unique fabric connections. For detailed information, see the following guides:

- *HP StorageWorks Secure Path 2.0D for IBM AIX installation guide*
- *HP StorageWorks IBM AIX Enterprise Virtual Array installation and configuration guide*

Installations in an HACMP environment

Use the following guidelines for installations in an HACMP environment:

- The Secure Path 2.0D Service Pack 3 for IBM AIX FC HBA driver must be installed on all nodes in the cluster accessing the RAID system.
- The binary file `cluster.HSGXX.scsi.support.1.0.0.1` must be installed in the hacmp directory if Secure Path is used.

More information about HACMP can be found in the following references:

- *HP StorageWorks HSG80 ACS solution software 8.7 for IBM AIX installation and configuration guide*
- *HP StorageWorks IBM AIX connectivity for the Enterprise Virtual Array release notes*

Partitioned storagesets

Storage units configured from partitioned storagesets must be identified and defined as other units on the RAID storage system. All partitions must be assigned to the same HSGx0 controller.

In a Secure Path environment, if units created from partitions have a preferred path set to a controller, all such partitions must have the same preferred path. Failover and failback events of a partitioned unit affect all partitions of the same storageset.

Connection offsets

If connection offsets are used with Secure Path, you must set the same offset value on both connections to the AIX HBA pair. See the *HP StorageWorks HSG80 ACS solution software 8.7 for IBM AIX installation and configuration guide* for instructions.

The cbxfcar autorecovery daemon

The Secure Path autorecovery daemon (`cbxfcar`) is installed with the FC HBA driver. When the driver is installed, you can add an entry in `/etc/inittab` to automatically start the `cbxfcar` daemon on system boot.

Operating considerations

Configuration

Use the `lsdev -Cc adapter` and `lsdev -Cc disk` commands to see information about the Secure Path adapter configuration.

```
# lsdev -Cc adapter
sa0     Available 01-S1    Standard I/O Serial Port
sa1     Available 01-S2    Standard I/O Serial Port
sa2     Available 01-S3    Standard I/O Serial Port
siokma0 Available 01-K1    Keyboard/Mouse Adapter
fda0    Available 01-D1    Standard I/O Diskette Adapter
scsi0   Available 10-60    Wide SCSI I/O Controller
iga0    Available 10-68    GXT110P Graphics Adapter
scsi1   Available 30-58    Wide SCSI I/O Controller
scsi2   Available 30-60    Wide/Fast-20 SCSI I/O Controller
```

```
scsi3   Available 30-68    Wide/Fast-20 SCSI I/O Controller
scsi4   Available 30-78    Wide/Fast-20 SCSI I/O Controller
sioka0  Available 01-K1-00 Keyboard Adapter
ppa0    Available 01-R1    Standard I/O Parallel Port Adapter
ent0    Available 10-70    IBM 10/100 Mbps Ethernet PCI Adapter
           (23100020)
ent1    Available 10-78    IBM 10/100 Mbps Ethernet PCI Adapter
           (23100020)
ent2    Available 10-80    IBM PCI Ethernet Adapter (22100020)
sa3     Available 30-70    IBM 8-Port EIA-232/RS-422A (PCI)
          Adapter
sioma0  Available 01-K1-01 Mouse Adapter
scsi5   Available 20-58    Cambex Fibre Channel I/O Controller
scsi6   Available 20-60    Cambex Fibre Channel I/O Controller

# lsdev -Cc disk
hdisk0  Available 10-60-00-8,0  16 Bit SCSI Disk Drive
hdisk1  Available 30-78-00-1,0  Other SCSI Disk Drive
hdisk2  Available 20-58-00-0,0  DEC HSG80 Command Console LUN
hdisk3  Available 20-58-00-0,3  DEC HSG80 RAID Array
hdisk4  Available 20-58-00-0,4  DEC HSG80 RAID Array
hdisk5  Available 20-58-00-0,5  DEC HSG80 RAID Array
hdisk6  Available 20-58-00-0,1  DEC HSG80 RAID Array
hdisk7  Available 20-58-00-0,2  DEC HSG80 RAID Array
```

In the previous example, the output DEC HSG80 RAID Array hdisks are all assigned to one of the two Cambex FC I/O controllers for the Secure Path configuration. This assignment occurs during configuration, and it is determined by the sequence in which the devices are found and defined. The sequence is irrelevant to Secure Path because the driver automatically switches I/O to the alternate path when an active path fails.

Controller software upgrades

HSGx0

You can upgrade the HP StorageWorks array controller software (ACS) without terminating I/O. This procedure is known as a *rolling upgrade*. See the *HP StorageWorks HSG80 array controller 8.7 maintenance and service guide* for detailed information about rolling upgrades.

HSVx

When upgrading EVA Virtual Controller Software (VCS) firmware, both controllers become inoperative. Secure Path for IBM AIX does not tolerate this condition. You must stop all operations to an EVA storage unit prior to upgrading the HSVx software.

Managing Secure Path 2.0D Service Pack 3 for IBM AIX using smit

Secure Path management tools have been integrated into the IBM AIX `smit` utility. From the `smit` menus, many different functions can be performed, such as:

- Monitoring failover
- Configuring failback
- Resolving failures

Most, but not all, of these functions may also be accessed by the Secure Path management utility (`cbxfcsm`). See the *HP StorageWorks Secure Path 2.0D for IBM AIX installation guide* for more information about `cbxfcsm`.

NOTE:

If at any point, you want to see the command line `smit` uses to execute a function, press **F6**. The command line is displayed.

From the `smit` utility System Management menu, select **Devices>Cambex Fibre Channel Adapter**. The following screen appears:

```
                        Cambex Fibre Channel Adapter

Move cursor to desired item and press Enter.

List All Cambex FC Adapters

Change / Show Characteristics of a Cambex FC Adapter

Generate Error Report

Trace Cambex FC Adapters

Change / Show Device Status

Configure Path / Show Path Status

Change / Show Auto Recovery of Cambex FC Adapters

F1=Help             F2=Refresh          F3=Cancel           F8=Image

F9=Shell            F10=Exit            Enter=Do
```

Table 2 describes the function of this menu.

Table 2 Cambex Fibre Channel Adapter device menu

Select:	To:
List All Cambex FC Adapters	Display a brief listing of all Cambex FC I/O Controllers installed on the system.
Change / Show Characteristics of a Cambex FC Adapter	Display a detailed menu outlining many different adjustable parameters for the Cambex FC adapter NOTE: The only characteristic that you should change is the DMA window size. This setting must be adjusted on certain systems to detect LUNs. If you are having difficulty detecting LUNs on your system, see Viewing LUNs after running cfgmgr, page 12.
Generate Error Report and **Trace Cambex FC Adapters**	Obtain system information when troubleshooting with an HP representative. For more information on these options, see Logging errors and debugging problems, page 12.
Change / Show Device Status	Display a list of hdisks that are under FC adapter control.
Change / Show Device Status and select an hdisk from the list	Display the current state of the LUN represented by that hdisk. You can move the online path of that LUN by selecting the desired online path from the pop-up menu, and pressing **Enter**. This transitions the LUN to the new path, provided the path is accessible.
Configure Path / Show Path Status	Display or change the current path status
Change / Show Auto Recovery of Cambex FC Adapters	Change the timing of probes by the `cbxfcar` daemon for failed or recovered paths. Secure Path probes a failed path to determine when the path returns to a Standby state. The options in this menu lets you adjust the frequency of the probing. • The Time Interval to Check Failed Paths (sec.) parameter determines the amount of time (in seconds) that passes between probes. • The Number of Inquiries to Check Failed Path parameter determines how many times the path must appear ready before it is configured as the standby path.

△ CAUTION:

Changing options other than DMA window size on the `Change / Show Characteristics of a Cambex adapter` menu can result in system instability or unpredictable behavior.

Dynamic LUNs

Storage units may be added or deleted from your overall storage configuration without having to stop I/O and reboot the system. You can add units to the currently active storage system. You can also add or remove a RAID storage system with one or more units defined.

Adding and removing storage units

See the *HP StorageWorks Secure Path 2.0D for IBM AIX installation guide* for instructions about adding or removing storage units.

Understanding hdisk-to-LUN assignments

The IBM AIX `cfgmgr` command configures storage units, making them available for use.

The hdisks assigned to the HSG80 RAID array are in sequence with the defined LUNs. This sequence can be interrupted by other devices that were defined previously by the IBM AIX system software. For example, hdisk4 through hdisk8 can be assigned to LUNs D1 through D5, hdisk9 can be another SCSI device, and hdisk10 through hdisk16 can be assigned to LUNs D6 through D12.

LUNs are not required to be created sequentially. For example, you can create LUNs D1, D4, D6, and D12. The first hdisk is assigned to the first LUN, (in this case, hdisk4 to LUN D1), and the other assignments will follow sequentially (hdisk5 to D4, hdisk6 to D6, and hdisk7 to D12). If another LUN, D3, is added after the previously defined LUNs are configured, the sequence mapping is disrupted and hdisk8 is assigned to D3.

Listing the hdisks

List the hdisks by entering the `# lsdev -Cc disk` command.

In this example, hdisk5 shows a series of numbers `2D-08-00-0,1`. The first two numbers, `2D-08` are associated with the HBA. The last 2 numbers, `0,1` are the target LUN designations.

```
# lsdev -Cc disk
hdisk0 Available 10-60-00-8,0 16 Bit SCSI Disk Drive
hdisk1 Available 30-78-00-1,0 Other SCSI Disk Drive
hdisk5 Available 2D-08-00-0,1 Other SCSI Disk Drive
```

Show units

List the units created on the RAID storage system by entering the CLI `SHOW UNITS` command. This requires a serial connection to the HSG80 storage system.

```
HSG_CONTROL> SHOW UNITS
LUN        Uses             Used by
------------------------------------------------------------
D1      DISK10000
D2      DISK20000
D4      DISK30000
D5      DISK30100
D6      DISK50300
D7      DISK30300
D8      DISK40100
```

Show association

List the association of hdisks to RAID storage units using the Secure Path utility, `/usr/cbxfc/cbxfcsm listall`. In the following example, `scsi2` and `scsi3` are the HBAs for Secure Path. The first number (`0`) is the target designation and the second number is the LUN.

```
# /usr/cbxfc/cbxfcsm listall
# Device       Online           Alternate
  hdisk4       scsi3 0,0        scsi2 0,0
  hdisk5       scsi3 0,1        scsi2 0,1
  hdisk6       scsi3 0,2        scsi2 0,2
  hdisk7       scsi3 0,4        scsi2 0,4
  hdisk8       scsi3 0,5        scsi2 0,5
  hdisk9       scsi3 0,7        scsi2 0,7
  hdisk10      scsi3 0,8        scsi2 0,8
  hdisk11      scsi3 0,10       scsi2 0,10
  hdisk12      scsi3 0,6        scsi2 0,6
```

In the previous example, the hdisk4 assignment to LUN 0 is the Console LUN. The Console LUN is always enabled and assigned LUN 0 when in SCSI-3 mode. When operating in SCSI-2 mode, you may disable the console LUN. HP recommends that LUN 0 be reserved for the command console LUN.

Reassigning storage units

Prior to reassigning a storage unit to a different LUN, the current LUN must be removed (see the *HP StorageWorks Secure Path 2.0D for IBM AIX installation guide*).

To assign a new LUN to a storage unit:

1. Initialize the storage unit using the CLI command `INIT`.

   ```
   INIT DISK40100
   ```

2. Assign a new LUN to the storage unit with the CLI `ADD` command.

   ```
   ADD D 100
   ```

3. Make the new LUN available with the `cfgmgr` command.
4. Import and mount volume groups previously exported.

See *HP StorageWorks Solution Software 8.x for IBM AIX user guide* for more information.

SCSI-3 considerations

Secure Path 2.0D Service Pack 3 for IBM AIX supports SCSI-3 mode. To use SCSI-3 mode, establish a connection to the HSG80, and then use the CLI `SET` command to set the HSG80 controllers to SCSI-3 mode. For example,

```
SET SCSI-VERSION=SCSI-3.
```

Both controllers are set to SCSI-3 mode.

There are a few issues concerning the use of SCSI-3 mode and Secure Path 2.0D Service Pack 3 for IBM AIX:

- In SCSI-3 mode, the CCL is always enabled on each port of each controller and assigned to LUN 0. If a storage unit has been assigned to LUN 0, the CCL prevails and that storage unit is not presented to Secure Path or IBM AIX.
- When configuring the system with SCSI-3 mode, a CCL is configured for each port on each controller. Because Secure Path uses only one port on each controller for each path, two CCLs are displayed when the IBM AIX command `lsdev-Ccdisk` is entered. Both CCLs are assigned the same target and LUN 0, but they are assigned to different HBAs. The maximum number of data LUNs is reduced from 32 to 31.
- The Secure Path utility `/usr/lpp/cbxfc/cbxfcsm listall` shows both paths for the CCL as active. In SCSI-3 mode, the status of the paths are disregarded because one path is always available, and the CCL is not under control of Secure Path.

Avoiding problem situations

Sequence of removing hdisks and HBAs

HP recommends that you remove the hdisks before you remove the HBAs from the host computer. An attempt to remove both the hdisks and the HBAs simultaneously using `rmdev -Rdl scsix` may cause a system freeze, forcing a reboot.

Paths to a RAID storage unit

EVA requires that at least one port from each controller be connected into each fabric.

Secure Path 2.0D Service Pack 3 for IBM AIX requires that at least one path per HBA exists from the server to a LUN on the RAID storage system.

Viewing LUNs after running cfgmgr

If you enter the `cfgmgr` command, and can see the HBAs but not the LUNs, set the DMA size to 64 MB by entering the following commands:

```
# rmdev -l scsi4
scsi4 Defined
# chdev -l scsi4 -a dma_window=64M
scsi4 changed
# mkdev -l scsi4
```

Performance on Secure Path systems

Avoid using multiple HBAs on the third PCI bus (pci2). Using pci2 on Secure Path systems has an adverse effect on system performance.

Logging errors and debugging problems

HP customer service representatives use the following commands to troubleshoot problems.

Command	Description
`# errpt -a` `# errpt -a > /tmp/errorlog.txt`	Prints a full output of errors logged by the system. HP recommends that the error log be saved in this format so it can be used as a tool to detect software problems.
`# /usr/lpp/cbxfc/runtrace`	A utility used to debug problems.
`# trcstop`	Stops the `runtrace` utility.
`# trcrpt > /tmp/trace.out`	Provides the contents of the /tmp/trace.out file to an HP representative for analysis.

You can enter the commands `errpt -a` and `runtrace` from the smit menus. These commands are referenced in the **Cambex Fibre Channel Adapter** menu as **Generate Error Report** and **Trace Cambex FC Adapters**. See Managing Secure Path 2.0D Service Pack 3 using smit for information about using smit. Example:

```
# errpt -a
hdisk4  Available 2D-08-00-0,0  DEC HSG80 Command Console LUN
hdisk5  Available 2D-08-00-0,1  DEC HSG80 RAID Array
hdisk6  Available 2D-08-00-0,2  DEC HSG80 RAID Array
hdisk7  Available 2D-08-00-0,4  DEC HSG80 RAID Array
hdisk8  Available 2D-08-00-0,5  DEC HSG80 RAID Array
hdisk9  Available 2D-08-00-0,7  DEC HSG80 RAID Array
hdisk10 Available 2D-08-00-0,8  DEC HSG80 RAID Array
hdisk11 Available 2D-08-00-0,10 DEC HSG80 RAID Array
hdisk12 Available 2D-08-00-0,6  DEC HSG80 RAID Array
```